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Enhancing Food Safety by Supporting Regulatory Agencies and Industry

For the regulations that govern our food safety to do the best job of protecting us, they need to be rooted in sound science. Providing that science is a basic part of the Agricultural Research Service's mission. But our food producers and processors must also know how to meet those regulations in an efficient, effective manner.

To accomplish this, ARS provides support to other agencies, for example, the U.S. Department of Agriculture's Food Safety and Inspection Service (FSIS) and the U.S. Food and Drug Administration (FDA), and works with industry stakeholders so that they all have the knowledge and tools to supply consumers with safe food.

Regulatory agencies often contact ARS to fill a specific need for data as a regulation is being developed. For example, when FDA began developing its rules for using raw manure as a soil amendment under the Food Safety Modernization Act, it needed solid objective data about how long pathogenic bacteria actually survive in manure-amended soils in different cropping systems and environments. So the agency turned to the ARS Environmental Microbial and Food Safety Laboratory in Beltsville, Maryland, to conduct the needed field studies and analyze the data.

The ARS Food Safety and Intervention Technologies Unit in Wyndmoor, Pennsylvania, working with Drexel University, is providing FSIS and FDA with the most comprehensive survey of the bacterium *Listeria monocytogenes* in retail ready-to-eat foods conducted in the past decade. The bacterium is one of the leading causes of death related to foodborne illness. This long-term study is looking at the distribution, rates, amounts, and subtypes of *L. monocytogenes* in ready-to-eat foods. Such data will allow an assessment of changes in *Listeria* prevalence and levels in these foods and will help validate interventions to ensure a wholesome food supply. Having current information is essential for FSIS and FDA to be able to revisit their *Listeria* Risk Assessment program, evaluate the relative public health risk, and effectively allocate their resources to mitigate that health risk.

At other times, ARS works more directly with industry on how to best to meet regulatory requirements for food safety by developing new knowledge and cost-effective tools to reduce risk of foodborne illnesses.

When concerns were raised about the survivability of pathogens in acidified foods, both FDA and the pickling industry turned to the ARS Food Science Research Unit in Raleigh, North Carolina, to do the research that would ensure consumer safety. This lab has a long history of ensuring food safety in commercial pickling. You can read the details of that story beginning on page 4 of this issue.

Sometimes ARS provides support by developing tools that will help regulatory agencies and industry enhance food safety. One such tool is ARS's Integrated Pathogen Modeling Program (IPMP 2013), developed by the Residue Chemistry and Predictive Microbiology Research Unit in Wyndmoor. The food industry needs mathematical models for predicting microbial growth and survival in foods, and the regulatory agencies need the models for conducting risk assessments of our food supply. However, developing such microbial models is not a trivial task; it commonly requires advanced training in statistics, mathematics, and even computer programming. IPMP 2013 simplifies the problem. It is a fully automated tool that allows accurate models to be developed without any programming knowledge or experience.

ARS offers this software package as a free tool to scientists and risk modelers around the world. Regulatory agencies and industry are already benefitting from it. Universities are also using IPMP 2013 to train the next generation of food safety managers on how to correctly develop models to predict microbial growth and survival in foods.

ARS-funded researchers at Purdue University's Center for Food Safety Engineering in West Lafayette, Indiana, are also helping food safety agencies by reducing the time it takes to identify harmful bacteria in food with the development of BARDOT sensor technology. This easy-to-use, portable system has tremendous potential for improving response to foodborne illness outbreaks, because the testing can be performed at the source, rather than in the laboratory. The utility of the BARDOT system was demonstrated by its ability to detect *Salmonella* in peanut butter within 24 hours with an accuracy of 98 percent, compared to the current FSIS method, which requires about 72 hours.

Whether ARS researchers are working with regulatory agencies, industry, or both, the sound, objective science they are providing is ultimately benefitting the consumer by ensuring that our food stays as safe as possible at every step from the farm to your table.

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